Large parts of Amazon may never recover, major study says

Swathes of rainforest have reached tipping point, research by scientists and Indigenous organisations concludes

Smoke rises from an illegally lit fire in a rainforest reserve south of Novo Progresso in Pará state, Brazil. Photograph: Carl de Souza/AFP/Getty Images

Andrew Downie

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Environmental destruction in parts of the Amazon is so complete that swathes of the rainforest have reached tipping point and might never be able to recover, a major study carried out by scientists and Indigenous organisations has found.

“The tipping point is not a future scenario but rather a stage already present in some areas of the region,” the report concludes. “Brazil and Bolivia concentrate 90% of all combined deforestation and degradation. As a result, savannization is already taking place in both countries.”

Scientists from the Amazonian Network of Georeferenced Socio-environmental Information (RAISG) worked with with the Coordinator of Indigenous Organizations of the Amazon Basin (Coica) to produce the study, Amazonia Against the Clock, one of the biggest so far, covering all nine of the nations that contain parts of the Amazon.

It found that only two of the nine, tiny Suriname and French Guiana, have at least half their forests still intact.

Amazonian Indigenous organisations representing 511 nations and allies are calling for a global pact for the permanent protection of 80% of the Amazon by 2025.

The 80% target is a massive challenge given that only 74% of the original forest remains. Urgent action is needed not only to protect the forest still standing but also to restore degraded land and get back to that 80% level.

“It’s difficult but doable,” said Alicia Guzmán, an Ecuadorian scientist who coordinated the report. “It is all dependent on the involvement of the Indigenous communities and people who live in the forest. That and the debt.”

Guzmán said giving Indigenous groups stewardship of more land – and crucially, providing state protection for it and removing legal loopholes that allow extractive industries in – was the surest way to guarantee preservation.

Almost half the Amazon has been designated either a protected area or Indigenous territory, and only 14% of all deforestation takes place there. Currently, about 100m hectares of Indigenous land are under dispute or awaiting formal government recognition.

“Having Indigenous people in the decision-making process means we count on the knowledge of those who know most about the forest,” said Guzmán. “And they need budgets.”

They also need their land to be safeguarded from land-grabbers and extractive industries.

Mining is one of the growing threats, with protected areas and Indigenous land among the areas most coveted by prospectors. Much of the mining is clandestine and illegal but around half in protected areas is done legally, and scientists called on governments to reject or revoke mining permits.

Oil is another threat, particularly in Ecuador, the source of 89% of all the crude exported from the region.

Oil blocks cover 9.4 % of the Amazon's surface and 43% of them are in protected areas and Indigenous land. More than half the Ecuadorian Amazon is designated as an oil block, the report said, and the portions in Peru (31%), Bolivia (29%) and Colombia (28%) are also worrying.

Of even greater concern is farming. Agriculture is responsible for 84% of deforestation, and the amount of land given over to farming has tripled since 1985, according to the report. Brazil is one of the world's main food exporters, with soy, beef and grains feeding large parts of the world and bringing in billions of dollars each year.

A key recommendation of the study is more collaboration between regional governments, international financial institutions and the private equity firms that hold much of the debt owed by Amazonian nations.

Latin America is the most indebted region in the developing world and writing off that debt in return for preservation commitments would be significant.

"They have a unique opportunity before them to forgive existing debt in exchange for commitments to end industrial extraction and promote protections in key priority areas, indigenous territories and protected areas," the report says.

Among the other 13 "solutions" proposed in the report are: a complete suspension of new licensing and financing for mining, oil, cattle ranching, large dams, logging, and other such activities; increased transparency and accountability along supply chains; the restoration of deforested land; new governance models that allow for increased representation and recognition for native peoples.

Although the task is enormous, there are reasons for optimism and particularly in Brazil, where the president, Jair Bolsonaro, faces the former incumbent Luiz Inácio Lula da Silva in a tense election on 2 October.

Lula leads in the polls. During his time in power in the 2000s, deforestation fell by more than 80%.

Football pitch-sized area of tropical rainforest lost every six seconds

This article is more than 2 years old

Report also warns Australia will experience more extreme fire seasons due to climate crisis

Forest clearance by fire near Boca do Acre in the Amazon basin in north-west Brazil in August 2019. Photograph: Lula Sampaio/AFP/Getty

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The amount of pristine tropical rainforest lost across the globe increased last year, as the equivalent of a football pitch disappeared every six seconds, a satellite-based analysis has found.

Nearly 12m hectares of tree cover was lost across the tropics, including nearly 4m hectares of dense, old rainforest that held significant stores of carbon and had been home to a vast array of wildlife, according to data from the University of Maryland.

Beyond the tropics, Australia's devastating bushfires led to a sixfold increase in tree cover loss across the continent in 2019 compared with the previous year. Rod Taylor, from the World Resources Institute, part of the Global Forest Watch network that released the analysis, said as the unprecedented fires continued into 2020, this was only a partial picture of the area affected in the southern fire season.

While Australia's eucalyptus trees are generally well adapted to respond to fire, Taylor said this year's blazes burned more intensely, having followed a severe drought, and spread rapidly due to high winds. The fires killed 33 people directly, an estimated 445 more through smoke inhalation, and hundreds of millions of animals.

"Whereas a normal fire might char the bark of a tree, this year's fires turned many trees into charcoal sticks," Taylor said. "Australia can expect more extreme fire seasons as fire risk increases due to climate change."

The loss of trees in the tropics was the third worst recorded since data was first collected in 2002, trailing behind only 2016 and 2017. The heaviest reduction continues to be in Brazil, which accounted for more than a third of all humid tropical forest loss. Government data shows that deforestation for agriculture and other new land uses increased rapidly in the Brazilian Amazon over the past year.

The biggest surge in forest loss was in Bolivia, where fires led to an 80% greater reduction in tree cover than in any previous year on record. The institute said many of the fires were probably deliberately lit to clear farming land for planting and spread into forests due to strong winds and drought exacerbated

by the climate crisis. It follows the Bolivian government making regulatory changes to encourage the expansion of agriculture.

There was a slight decrease in forest loss in the Democratic Republic of the Congo, but it was still the third highest year on record, largely due to cyclical agricultural operations, though the institute said there was emerging evidence that commercial logging, mining and clearing for plantations was having an impact.

Primary forest loss was down about 50% in both Ghana and Cote d'Ivoire, and reduced for a third straight year in Indonesia, where it fell back to a level not seen for more than 15 years. This follows Jakarta introducing a permanent moratorium on clearing for oil palm plantations and increased efforts to ensure that laws were enforced.

Frances Seymour, a senior fellow with the institute, said the level of global forest loss was unacceptable and that it was clear what was needed to reverse the trend. "If governments put into place good policies and enforce the law, forest loss goes down," she said. "But if governments relax restrictions on burning, or signal an intent to open up indigenous territories for commercial exploitation, forest loss goes up."

Seymour said the international community could help address the problem by introducing economic or market incentives for protecting forests. She called for governments to embrace four steps: preventing forest burning; increasing monitoring and enforcement to stop breaches; providing the poor and hungry with alternatives to forest exploitation; and not reducing protections to aid the economic recovery from the Covid-19 pandemic.

Ecosystems the size of Amazon 'can collapse within decades'

This article is more than 2 years old

Large biomes can break down like Jenga bricks once tipping point reached, research finds

A farmer and his dog in a burnt region of the Amazon rainforest in Rondônia state, Brazil. Photograph: Carl de Souza/AFP/Getty

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Even large ecosystems the size of the Amazon rainforest can collapse in a few decades, according to a study that shows bigger biomes break up relatively faster than small ones.

The research reveals that once a tipping point has been passed, breakdowns do not occur gradually like an unravelling thread, but rapidly like a stack of Jenga bricks after a keystone piece has been dislodged.

The authors of the study, published on Tuesday in the Nature Communications journal, said the results should warn policymakers they had less time than they realised to deal with the multiple climate and biodiversity crises facing the world.

To examine the relationship between an ecosystem's size and the speed of its collapse, the authors looked at 42 previous cases of "regime shift". This is the term used to describe a change from one state to another – for example, the collapse of fisheries in Newfoundland, the death of vegetation in the Sahel, desertification of agricultural lands in Niger, bleaching of coral reefs in Jamaica, and the eutrophication of Lake Erhai in China.

They found that bigger and more complex biomes were initially more resilient than small, biologically simpler systems. However, once the former hit a tipping point, they collapse relatively faster because failures repeat throughout their modular structure. As a result, the bigger the ecosystem, the harder it is likely to fall.

Based on their statistical analysis, the authors estimate an ecosystem the size of the Amazon (approximately 5.5m km2) could collapse in approximately 50 years once a tipping point had been reached. For a system the size of the Caribbean coral reefs (about 20,000 km2), collapse could occur in 15 years once triggered.

The paper concludes: "We must prepare for regime shifts in any natural system to occur over the 'human' timescales of years and decades, rather than multigenerational timescales of centuries and millennia.

"Humanity now needs to prepare for changes in ecosystems that are faster than we previously envisaged through our traditional linear view of the world, including across Earth's largest and most iconic ecosystems, and the social-ecological systems that they support."

The paper says this could be the case in Australia where the recent Australian bushfires followed protracted periods of drought and may indicate a shift to a drier ecosystem.

Scientists were already aware that systems tended to decline much faster than they grew but the new study quantifies and explains this trend.

"What is new is that we are showing this is part of a wider story. The larger the system, the greater the fragility and the proportionately quicker collapses,"

John Dearing, professor in physical geography at the University of Southampton and lead author of the study, said.

“What we are saying is don’t be taken in by the longevity of these systems just because they may have been around for thousands, if not millions, of years – they will collapse much more rapidly than we think.”

Dearing said he was concerned that one of the possible implications of the study was that complete destruction of the Amazon could occur within his grandchildren’s lifetimes.

“This is a paper that is satisfying from a scientific point of view, but worrying from a personal point of view. You’d rather not come up with such a set of results,” he said.

A separate study last week warned the Amazon could shift within the next decade into a source of carbon emissions rather than a sink, because of damage caused by loggers, farmers and global heating.

Experts said the new findings should be a spur to action.

“I think the combination of theory, modelling and observations is especially persuasive in this paper, and should alert us to risks from human activities that perturb the large and apparently stable ecosystems upon which we depend,” said Georgina Mace, professor of biodiversity and ecosystems at University College London, who was not involved in the studies.

“There are effective actions that we can take now, such as protecting the existing forest, managing it to maintain diversity, and reducing the direct pressures from logging, burning, clearance and climate change.”

These views were echoed by Ima Vieira, an ecologist at Museu Emílio Goeldi in Belém, Brazil. “This is a very important paper. For Brazil to avoid the ecosystem collapse modelled in this study, we need to strengthen governance associated to imposing heavy fines on companies with dirty supply chains, divestment strategies targeting key violators and enforcement of existing laws related to environmental crimes. And we have to be quick.”

However, the methodology was not universally accepted. Erika Berenguer, a senior research associate at the University of Oxford and Lancaster University,

said the regime shifts paper relied too much on data from lakes and oceans to be useful as an indicator of what would happen to rainforests.

“While there is no doubt the Amazon is at great risk and that a tipping point is likely, such inflated claims do not help either science or policy making,” she said.

The authors said their study was not a forecast about a specific region but a guide to the speed at which change could occur.